AMENDMENTS TO THE CLAIMS

Please amend the present application as follows:

Claims

1. (Cancelled)

2. (Currently amended) A vertical cavity surface ~~emitting~~ laser, comprising:

an optical cavity, including:

a first non-concave reflector positioned at a first end of the optical cavity, the reflector being configured to focus light that reflects off the reflector back in an opposite direction to avoid diffraction losses from the optical cavity, ~~The laser of claim 1, wherein~~ the first non-concave reflector ~~includes~~ including an outer layer of material that ~~has a thickness that varies as a function of radial distance out from an axial center of the outer layer,~~ emulates a concave mirror; and

a second non-concave reflector positioned at a second end of the optical cavity that receives and reflects light reflected from the first non-concave reflector.

3. (Currently amended) The laser of claim 2, wherein the outer layer includes a substantially convex ~~, semispherical~~ outer surface ~~and a substantially planar inner surface.~~ having a thickness that varies as a function of radial distance out from an axial center of the outer layer, and wherein the thickness provides a phase delay that varies as a function of a distance from the axial center of the outer layer.

4 (Currently amended) The laser of claim ~~1~~ 2, wherein the ~~first non-concave reflector includes an~~ outer layer of material ~~that~~ has an index of refraction that varies as a function of radial distance out from an axial center of the outer layer.

5. (Previously amended) The laser of claim 4, wherein the outer layer is substantially planar.

6. (Currently amended) The laser of claim ~~1~~ 2, wherein the reflectors include a plurality of material layers oriented in a stacked arrangement.

7. (Previously amended) The laser of claim 6, wherein the material layers have different indices of refraction than adjacent material layers.

8. (Previously amended) The laser of claim 6, wherein the material layers have quarter wave optical thicknesses.

9. (Cancelled)

10. (Currently amended) A vertical cavity surface emitting laser, comprising:

an optical cavity, including:

a first non-concave means for reflecting light at a first end of the optical cavity, the first non-concave means for reflecting light including means for focusing the light entering and exiting the first non-concave means so that diffraction losses from the optical cavity are reduced, ~~The laser of claim 9, wherein~~ the first non-concave means for reflecting light ~~includes~~ including an outer layer of material that ~~has a thickness that varies as a function of radial distance out from an axial center of the outer layer,~~ emulates a concave mirror; and

a second non-concave means for reflecting light at a second end of the optical cavity that receives and reflects light reflected from the first non-concave means for reflecting light.

11. (Currently amended) The laser of claim 10, wherein the outer layer includes a substantially convex ~~, semispherical~~ outer surface ~~and a substantially planar inner surface.~~ having a thickness that varies as a function of radial distance out from an axial center of the outer layer, and wherein the thickness provides a phase delay that varies as a function of a distance from the axial center of the outer layer.

12. (Currently amended) The laser of claim ~~9~~ 10, wherein the ~~first non-concave means for reflecting light includes an~~ outer layer of material ~~that~~ has an index of refraction that varies as a function of radial distance out from an axial center of the outer layer.

13. (Previously amended) The laser of claim 12, wherein the outer layer is substantially planar.

14. (Currently amended) The laser of claim ~~9~~ 10, wherein the means for reflecting light at the first and second ends of the cavity include a plurality of material layers oriented in a stacked arrangement.

15. (Previously amended) The laser of claim 14, wherein the material layers have different indices of refraction than adjacent material layers.

16. (Previously amended) The laser of claim 14, wherein the material layers have quarter wave optical thicknesses.

17-18. (Cancelled)

19. (Previously amended) A vertical cavity surface emitting laser, comprising:

an optical cavity, including:

a first reflector positioned at a first end of the optical cavity, the first reflector including a layer of material that has an index of refraction that varies as a function of radial distance out from an axial center of the layer such that the first reflector is configured to focus light that reflects off the first reflector to avoid diffraction losses from the optical cavity; and

a second reflector positioned at a second end of the optical cavity that receives and reflects light reflected from the first reflector.

20. (Currently amended) The laser of claim ~~20~~ 19, wherein the outer layer is substantially planar.

21. (Previously amended) A method for manipulating light in a vertical cavity surface emitting laser, comprising:

reflecting light between two reflectors of an optical cavity of the laser; and

focusing the light with a layer of material having a thickness that varies as a function of radial distance out from an axial center of the layer to reduce diffraction losses.

22. (Previously amended) A method for manipulating light in a vertical cavity surface emitting laser, comprising:

reflecting light between two reflectors of an optical cavity of the laser; and

focusing the light with a layer of material having an index of refraction that varies as a function of radial distance out from an axial center of the layer to reduce diffraction losses.

23. (Currently amended) The laser of claim ~~1~~ 2, further comprising a semiconductor substrate upon which the laser is formed, the optical cavity being positioned perpendicular to the semiconductor substrate; and

wherein the laser emits light in a direction perpendicular to the semiconductor substrate.

24. (Cancelled)

25. (Currently amended) A vertical semiconductor optical filter, comprising:

a first non-concave reflector positioned at a first end of the optical cavity, the reflector being configured to focus light that reflects off the reflector back in an opposite direction to avoid diffraction losses from the optical cavity, ~~The optical filter of claim 24, wherein~~ the first non-concave reflector ~~includes~~ including an outer layer of material that ~~has a thickness that varies as a function of radial distance out from an axial center of the outer layer,~~ emulates a concave mirror; and

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a second non-concave reflector positioned at a second end of the optical cavity that receives and reflects light reflected from the first non-concave reflector.

26. (Currently amended) The optical filter of claim 25, wherein the outer layer ~~includes a substantially convex , semispherical~~ outer surface ~~and a substantially planar inner surface.~~ having a thickness that varies as a function of radial distance out from an axial center of the outer layer. and wherein the thickness provides a phase delay that varies as a function of a distance from the axial center of the outer layer.

27. (Currently amended) The optical filter of claim ~~24~~ 25, wherein the ~~first non-concave reflector includes an~~ outer layer of material ~~that~~ has an index of refraction that varies as a function of radial distance out from an axial center of the outer layer.

28. (Previously added) The optical filter of claim 27, wherein the outer layer is substantially planar.

29. (Currently amended) The optical filter of claim ~~24~~ 25, wherein the reflectors include a plurality of material layers oriented in a stacked arrangement.

30. (Previously added) The optical filter of claim 29, wherein the material layers have different indices of refraction than adjacent material layers.

31. (Previously added) The optical filter of claim 29, wherein the material layers have quarter wave optical thicknesses.

32. (Currently amended) The optical filter of claim ~~24~~ 25, further comprising a semiconductor substrate upon which the laser is formed, the optical cavity being positioned perpendicular to the semiconductor substrate; and

wherein light enters the optical filter in a direction perpendicular to the semiconductor substrate.

33. (Cancelled)

34. (Currently amended) A vertical semiconductor optical filter, comprising:

first non-concave means for reflecting light at a first end of the optical cavity, the first non-concave means for reflecting light including means for focusing the light entering and exiting the first non-concave means so that diffraction losses from the optical cavity are reduced, ~~The optical filter of claim 33, wherein~~ the first non-concave means for reflecting light ~~includes~~ including an outer layer of material that ~~has a thickness that varies as a function of radial distance out from an axial center of the outer layer,~~ emulates a concave mirror; and

second non-concave means for reflecting light at a second end of the optical cavity that receives and refl cts light reflected from the first non-concave means for reflecting light.

35. (Currently amended) The optical filter of claim 34, wherein the outer layer includes a substantially convex ~~, semispherical~~ outer surface ~~and a substantially planar inner surface.~~ having a thickness that varies as a function of radial distance out from an axial center of the outer layer, and wherein the thickness provides a phase delay that varies as a function of a distance from the axial center of the outer layer.

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36. (Currently amended) The optical filter of claim ~~33~~ 34, wherein the first non-concave means for reflecting light includes an outer layer of material that has an index of refraction that varies as a function of radial distance out from an axial center of the outer layer.

37. (Previously added) The optical filter of claim 36, wherein the outer layer is substantially planar.

38. (Currently amended) The optical filter of claim ~~33~~ 34, wherein the means for reflecting light at the first and second ends of the cavity include a plurality of material layers oriented in a stacked arrangement.

39. (Previously added) The optical filter of claim 38, wherein the material layers have different indices of refraction than adjacent material layers.

40. (Previously added) The optical filter of claim 38, wherein the material layers have quarter wave optical thicknesses.

41. (Previously added) A method for manipulating light in a vertical semiconductor optical filter, comprising:

reflecting light between two reflectors of an optical cavity of the optical filter; and

focusing the light with a layer of material having a thickness that varies as a function of radial distance out from an axial center of the layer to reduce diffraction losses.